

HOTS-Based Learning in Junior High Schools and Its Implication on Teachers' Professional Development

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ABSTRACT

Recently, there have been lots of trainings aimed at equipping teachers with knowledge and skills in designing HOTS (Higher Order Thinking Skills) – based learning and assessment, but do teachers transfer what they have acquired to the classroom appropriately? This is a descriptive research that employs case study method. The research seeks to reveal how HOTS-based learning is applied by teachers who have joined trainings on HOTS-based learning and assessment, and its implication toward their professional development in Junior High Schools. Participants of the research were 3 teachers teaching English in 3 different Junior High Schools in West Sumatera. The data were obtained through semi-structured interviews. The results of the research indicate that the teachers have already had clear understanding on the nature of HOTS, but HOTS-based learning is not yet optimally conducted at school due to the teachers' less capability in translating the knowledge on HOTS into practical activities. Furthermore, it is found that HOTS-based trainings and workshops offered so far seem more intended to equip teachers to design HOTS-based questions for testing purposes. Hence, the results imply that the upcoming trainings or workshop provided for the teachers should balance the needs for assessment and the needs for learning materials and activities. They should also be strengthened with coaching programs to help the teachers correctly apply what they have acquired, especially in designing materials and learning activities. Last, this study has also opened a potential future research to discover students' perception about learning process and assessment given by teachers who have joined HOTS-based trainings.

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1. INTRODUCTION

The results of the 2018 PISA study released in December 2019 showed that Indonesia was in 74th position out of 79 participating countries in the world (Tohir, 2019). This achievement has become a matter of evaluation for the education system in Indonesia by which The Ministry of Education and Culture issues policies to improve the quality of education by implementing learning models that are able to promote students' Higher Order Thinking Skills (HOTS). The embedding of HOTS to national curriculum is expected to lead students to become millennials who have the ability to communicate, collaborate, think critically and creatively; able to solve problems; and able to do innovations. The ability to think critically is regarded as the key point to make achievement in life, and it is mostly developed in the classroom (Nessel & Graham, 2007). In addition to critical thinking, (Marshall & Horton, 2011) propose that logical thinking and reasoning are also respected as basic skills for daily life.

Regardless to the issue of upgrading Indonesian achievement in PISA, the high demand for the implementation of the HOTS model in Indonesia is closely related to preparing a generation that is able to address the challenges of the Industrial Revolution 4.0 era dealing with information and technology advancement. In other words, they are not only prepared to be excellent in academic world but are also capable, critical, and skilled in solving various related real-life problems. To achieve these goals, teachers are highly demanded to equip themselves with knowledge and skills on HOTS subject. They must be able to design lesson plans, learning materials, learning activities, and learning assessment that could promote students' critical thinking skills.

Hence, the burden to boost students' critical thinking seems to be more mandated to teachers because as previously mentioned by Nessel and Graham (2007) that this skill mostly grows and develops in schools. Therefore, the teacher's understanding of HOTS-based learning is very crucial and urgent. To address this need, the government through various relevant educational institutions hold a number of trainings in order to improve the knowledge and skills of teachers in designing HOTS-based learning and assessment. Some of the trainings are in the form of seminars or workshop both online and offline; some are within a day or a few hours, and some are one week or more. Selected teachers are usually invited to attend trainings via zoom meetings (especially during the pandemic), and now there are those who can attend fully board training.

HOTS issues then have attracted teachers, lecturers, and other academic fellows' attention to analyze and evaluate how this model is applied and improved in the classroom. No wonder then there is a lot of research that put its concern on issues related to HOTS matters. Retnawati (2018) carried out a study aiming at describing teachers' knowledge about higher order thinking skills (HOTS). She collected data through a test and Focus Group Discussion with 27 Mathematics teachers in Junior High Schools across 7 provinces in Indonesia. The results of her research show that teachers' knowledge about HOTS, and their ability to improve students' HOTS, solve HOTS-based problems, and measure students' HOTS are still low. They, in fact, already understand the importance of HOTS and teaching it using numerous innovative learning models. Furthermore, Tyas (2019) conducted a research intended to find out the challenges faced by EFL teachers in developing HOTS – based questions. To answer her research question, 18 in-service EFL teachers teaching in senior high schools in different regions in Central Java and East Java, Indonesia were involved. The results of her research show that the challenges faced by the teachers are classified into three categories, namely teachers' aspect, teaching and learning aspects, and students' aspect. Of the three, teachers' aspect is more dominant that include their limited understanding about the concept of HOTS and HOTS – based questions, limited experience in developing HOTS-based assessment, and the limited resources of learning, and the lack of knowledge and experience that teachers had. In addition, Giri (2021) examined the perception of 5 English teachers teaching in a Senior High School towards HOTS-based Learning in EFL classroom in Buleleng, Bali. By means of interview guideline she revealed that the teachers have limited knowledge and lack of training related to designing lesson plan, and applying teaching strategies, and designing assessment. In the same year, (Utami & Inderawati, 2021) examined the teachers' beliefs in HOTS integration to the teaching reading comprehension and how the beliefs were employed in the practices

of teaching reading. The participants of her research were two EFL teachers that had ever joined HOTS-based learning training intended to develop teachers' capability in formulating questions that provoke higher order thinking skills and applying them in the classroom. The results shared that the teachers had strong beliefs on the concept of HOTS and its components, but their beliefs were not completely reflected, especially in questions and assignment addressed to students.

From the previous studies, it could be highlighted that most of the research shared that teachers are aware of the importance of applying HOTS in the learning process, but some of them still have limited knowledge and skills in its practice, and some others have already had good understanding on that topic yet their understandings are not reflected in their teaching. The word "teaching" in the former studies seems to relate to the teachers' competence in formulating HOTS-based questions rather than in designing HOTS-based learning materials and activities. Dissimilar from the past studies, this research was conducted as a response to the need for HOTS-based learning in junior high school level to prepare students for the PISA and AKM exams. In junior high school, the AKM test is taken by the second-year students, and PISA is taken by those at the age of 15 or equivalent to grade 3 of junior high school. So far, students taking both types of HOTS-based tests do not get HOTS-based learning, and they are not familiar with the types of questions tested on these tests. Dealing with this issue, the teachers must have sufficient knowledge and skills to design not only HOTS-level questions but also learning materials and learning activities to promote students' critical thinking skills. Teachers, especially those involved as participants in this study, have taken trainings for HOTS-based learning and assessment. The current study then aims to see not only how teachers develop HOTS-based questions, but also how they design HOTS-based instructional materials (lesson plans and learning materials) and learning activities as the reflection of the knowledge and skills they acquired in the previous trainings. The implication of the findings toward the teachers' professional development is also a part of the research's concern.

2. METHODS

This is a descriptive qualitative study using a case study method. The participants of the research were three female teachers teaching English in three different schools in West Sumatera. The sample was chosen purposively for they previously had taken a 5 day-workshop aimed to enhance and update their knowledge and skills in HOTS-based instructional materials and assessment. The data of the research were obtained by means of interview guidelines. The questions of the interview were semi-structured and developed on the basis of the ideas of Kyriacou (2007) highlighting that teachers are demanded to have good understanding and skills in 8 essential teaching areas that could contribute to creating successful classroom practice, 3 of which are planning the lessons (including lesson plans and learning materials), presenting the lessons (including learning activities), and assessing students' progress. In addition Kyriacou (2007) also argues that knowledge about the methods or approaches to be applied is also crucial. During the interview session that was conducted via phone call, the teachers were asked about their understanding on several issues including the nature of HOTS-based learning, HOTS-based instructional materials (lesson plans and learning materials), HOTS-based classroom/learning activity, and HOTS-based assessment. The data gathered from the interviews were transcribed. The researchers then selected as well as classified the data based on the issues and questions discussed in this research. Irrelevant answers were eliminated. The data then were analyzed and interpreted in order to answer the research questions.

3. FINDINGS AND DISCUSSION

The results of this study about the teachers' understanding on the nature of HOTS, how HOTS-based instructional materials, learning activities as well as learning assessment were developed at schools are described in the following session.

How do teachers define HOTS-based learning?

Being asked about the nature of HOTS-based learning, in general, all the teachers agree that it is the learning process that seeks to develop the students' critical thinking. Teacher B said that,

"I think it is intended to teach students to think critically, and aaa...how do you call it? Aaa...creatively. The problems we offer to the students should be real...the problems they face in their daily life.After solving the problems they could learn something from."

Quite similar to Teacher B, Teacher A and C argued that HOTS-based learning should challenge students to think critically and enable them to solve problems using their own ways. Based on what they shared, it seems that the teachers have already had a clear and good understanding on what HOTS-based learning is and what goals to be achieved. Even though it is not completely defined, some of the characteristics of HOTS-based learning are well-mentioned.

The teachers' responses on this issue are simply displayed in the following table:

Table 1. Teachers' Understanding on the Nature of HOTS-Based Learning

Teacher A	Learning process: that is intended to develop students' critical thinking from C4 to C6 (from analysis, evaluation to creation); through which teachers challenge students with real life problems; and that enables students to solve problems
Teacher B	Learning process: that teaches students to think critically and creatively; and that enables students to analyze the problems and take a lesson from.
Teacher C	Learning process: that triggers students to think critically; and that make use the learning materials related to the students' real life (up to date)

This result is quite different from those conducted by Retnawati (2018) and Tyas (2019) highlighting that the teachers have less understanding on the concepts of HOTS. The difference might be resulted from the type of participants involved as the source of the data. The teachers involved in the above two studies have never been prepared with any trainings on HOTS, while the current study is similar to Utami (2021) obtaining data from teachers who have gotten trainings on HOTS-based learning and assessment. They could explain how HOTS-based learning be like and what it is intended for. Although the ideas conveyed are incomplete, but at least they highlight the key points of HOTS mentioned by Chonklin and Manfro (2012) which are critical and creative, and those shared by Brookhart (2010) including critical thinking and problem solving. Teachers' understanding on the nature of HOTS learning, in fact, is highly essential to be taken into account as it is the fundamental factor determining what and how learning process are conducted. This is in accordance with what is said by Afifah and Retnawati (2019) that teacher's understanding on HOTS would affect the way they teach HOTS in the classroom. Having insufficient knowledge about HOTS would result in teachers' difficulties in designing appropriate learning materials and learning activities. This concept is not intended to share that those who are able to define what HOTS is would be certainly competent to carry out what so-called HOTS-based learning instruction. Yusoff and Seman (2018) state that the ability to provide correct responses on the nature of HOTS does not mean that they are able to translate the understanding into action. This issue is the reason for which this research is also meant to see whether the teachers have already transformed their understanding on HOTS into classroom practice or not.

Are the instructional materials already HOTS-based?

Having good understanding on HOTS-based learning, in fact, has challenged the teachers to redesign the instructional materials including lesson plans and learning materials to support the learning. In the term of the lesson plans, the three teachers share similar ideas that they revise some indicators they think are still on LOTS level. For example, the indicator “the students are able to understand ...” is improved into “the students are able to analyze ...”. The teachers agree that it is easier for them to reformulate the competence and indicators stated in the lesson plans as they could conform them to Bloom Taxonomy’s charts. They just have to adjust every indicator to meet C4, C5 or C6 of the Taxonomy’s levels

Related to the learning materials, Teacher A said that few of the materials, which were taken from internet, are assumed to be HOTS-based. She did not use materials from the books provided at school as she thinks that they lack exercises and activities. Furthermore, Teacher B argues that only materials for teaching writing could be regarded as HOTS-based.

“I couldn’t tell you that they (the learning materials) are completely HOTS-based. I just apply it in my writing class, you know I apply R2L model that I learned from the workshop. Mmm...for reading class...errr...I don’t have any ideas yet. I just don’t have any ideas how to teach, for example, HOTS-based transactional texts.They are like expression of helps, expression of hope...sorts of...” For the lesson plans, yes..it is already HOTS-based I think, hehe...but may be they need to be revised, I’m not sure.

In this case, she applied the learning model she learnt from the workshop she joined only for her writing class. She is likely to need more guidance with more workshops or training with HOTS-based topics covering the four skills taught in English. Meanwhile Teacher C admitted that she has designed the HOTS-based lesson plans, but she is not sure about the learning materials.

“For English class that I teach, yes..the lesson plan has been HOTS-based. But for the materials I’m not so sure. We have designed them to stimulate students’ critical thinking, but we are just in doubt, hehe. We are just not sure whether they have HOTS-based or still on LOTS level.”

In short, the teachers’ belief on whether the instructional materials have already HOTS-based or not is presented in the following table.

Table 2. Teachers’ Belief on the use of HOTS-Based Instructional Materials in the Classroom

Teacher A	The lesson plans have already been adjusted to promote HOTS-based learning, but the teachers are in doubt whether it meets HOTS-based standard or not; Few of the learning materials are already HOTS-based; and Most of the learning materials are taken from internet and other sources as the books provided are not yet accompanied with sufficient exercises or activities
Teacher B	The lesson plans have already been adjusted to promote HOTS-based learning, but the teachers are in doubt whether it meets HOTS-based standard or not; and Learning materials for writing class are already HOTS-based
Teacher C	The lesson plans have already been adjusted to promote HOTS-based learning, but the teachers are in doubt whether it meets HOTS-based standard or not The learning materials has already been HOTS-based, but they still need to be reviewed

The data presented in Table 2 indicates that the teachers who had taken workshops on HOTS Literacy have put some efforts to improve the quality of the instructional materials in their schools, but they are still unsure that what they did to the materials is as it is demanded in HOTS. They said that they did not have any benchmarks as guidance to assure that the lesson plans and the teaching materials they designed had met the HOTS requirements. Apart from that, they also do not have experts or counselors they can contact to consult the validity of the instructional materials developed.

Are learning activities already HOTS-based?

In learning activities, Teacher A seems to have problems with the differences in students' abilities in the classroom. She found that students with low academic ability had not been able to follow the HOTS-based learning for which she always started the lesson with LOTS questions. She admits that the portion of HOTS-based activities is still smaller than that of LOTS, as she said, "LOTS questions are more frequently asked to motivate students to speak up in the classroom". Meanwhile, Teacher B tends to ask questions for which the students need to relate the information they get from the text to the realities of everyday life. She said "For example, after learning mmm...the disadvantages of greasy food, I asked them about what people can do to ... aaa... reduce the amount of oil in food." Furthermore, teacher C focuses on applying what she has just gotten from the workshop, applying R2L (note taking and joint construction) model for writing class. Being asked about what sorts of learning activities to be done in other classes (besides writing), she does not have any ideas yet.

Table 3. The Implementation of HOTS-Based Learning Activity

Teacher A	Started from LOTS; Students with low academic ability find it is hard to get involved in HOTS-based learning activity; and For writing class, a new HOTS-based learning model has already been applied
Teacher B	Asking questions that leads students to think beyond the text; For writing class, a new HOTS-based learning model has already been applied; and For other subjects (reading and speaking), it is still questioned whether the activities have already been HOTS-based or not.
Teacher C	Using R2L model for writing class; and Finding key words

From Table 2, Teacher B seems to have a clearer picture of HOTS-based learning activities than the other two. Nevertheless, she is still unsure about the questions she asks to provoke students' critical thinking and keep asking, "If the answers to the questions are unstated in the text, can they be confirmed as HOTS?" Meanwhile, Teacher A feels that HOTS-based learning activities cannot be applied directly to students who have low academic abilities. She argues that the students need to be guided first with LOTS questions and exercises focusing on understanding. Her responses toward this issue share her belief that HOTS is somewhat difficult to be implemented in the classroom, especially that with heterogeneous students. This finding is line with what is underlined by Retnawati (2016) that students' capability which are varied could become one of the challenges for teachers in applying HOTS-based learning. Teacher A thinks that HOTS would be well accepted in a class attended by students with higher academic competence.

The fact that all teachers have already applied a HOTS-based learning model they got from the previous training predominates the data presented in table 2. The model is intended to enable students to write factual and non-factual texts. Since they have trained to practice the model in the workshop and got assistance from the instructors while implementing it in the classroom, the teachers feel confident that what they do in the writing class is correctly HOTS-based. The teachers, however, are still confused about what activities they should do when teaching other skills such as reading and speaking. They also do not have any ideas of what other HOTS-based model or activities to be used in writing class. They, in fact, are well aware that it is unviable to use the same model every time of teaching.

The above results show that teachers are enthusiastic to bring what they have learned into the classroom. Those teachers, however, need assistance to ensure that what they do is in accordance with what it should be. Furthermore, they also need to be equipped with strategies that allow them to imagine or design HOTS-based learning activities based on Bloom's Taxonomy's chart lest they would stick on the same model. It should be a part of the government concern as well the institutions or people in charge of holding any professional development trainings that the teachers are likely to quit from

applying the model learnt as they feel it is monotonous and ineffective for other situations. In addition to exposing teachers to the latest HOTS models, the instructors are also demanded to guide teachers to find out any potential activities that could be developed from the operational verbs of taxonomy's chart. ***Is HOTS-based assessment already applied at school?***

After knowing that Indonesia's PISA score was getting worse in 2018, the most massive response taken by the policy makers was to socialize what HOTS is like and how to design it. Not surprisingly, then, a number of training and workshops are held to strengthen teachers' competence in this subject.

Table 4. The Implementation of HOTS-Based Assessment

Teacher A	The tests are not yet HOTS-based
Teacher B	A small portion of the test items are thought as HOTS-based, but the teachers are not so sure.
Teacher C	The tests are not yet HOTS-based (Teacher C needs other teachers to agree on the changes she will do to the assessment form. Many teachers at her school do not yet get any training on HOTS)

Unfortunately, in this research, only teacher B admits that she has designed a HOTS-based test in a smaller portion compared to LOTS items. She explained, "We actually have put HOTS-based questions into the test, but they are in a very small portion." She further explains that she is not sure whether it is really HOTS or not, "And sometimes we are in doubt whether the questions are appropriately HOTS-based or not, hehe." Meanwhile, teachers A and C have never made HOTS questions for assessment materials even though they have attended two trainings. Teacher A feels that the time available to design HOTS questions is not enough because the final semester exams are approaching, while she is also confused whether the questions she have already designed are HOTS or not. Her focus with other English teachers at this time is to design questions that cover all the teaching materials that students have studied. "The most important thing now is that the test could cover all of the materials taught to the students..... Maybe in the next semester...we design HOTS-based test in the next semester, we try." Slightly different from teacher B, teacher C has not designed HOTS-based exam questions because she feels the need to discuss them with English teachers who incidentally have never attended HOTS-based assessment trainings. Actually, there have been scavenging activities carried out by teachers who have attended training to their friends, but they have not yet gotten a complete picture of the form of the questions called HOTS. From these situations, it can be predicted that the teachers would return to writing questions as before which in large numbers were LOTS in nature. This is in line with what Mishra and Kotecha (2016) said that many teachers have attended HOTS training, but they still tend to develop LOTS-based questions instead of HOTS-based items.

The explanation above shows that teachers have not been fully able to design HOTS-based exam questions even though they have attended two trainings. This, however, certainly does not mean to say that the trainings failed in educating teachers in designing assessment questions that challenge students' critical thinking, but they likely need to be asserted with other programs for reinforcement purposes.

The implication of the research findings toward the teachers' professional development

The teachers are very grateful for the opportunity they got to improve their knowledge and skills in the field of HOTS literacy, but they expect that the future training could provide them not only with theoretical knowledge of designing HOTS-based assessment but also with its practical procedures. They need trainings that focus on the way to design the HOTS-based assessment through which they are provided with models on how to formulate the test items that in fact are presented in several types; not only in the form of multiple choice and essay but also in the form of true/false, short answers, matching, and complex multiple choice. They also expect to get intensive guidance so that they can consult and get input whether what they have made is in accordance with HOTS demands.

From the interview, it is also revealed that the trainings the teachers attended previously put more concern on how to design HOTS-based assessment rather than on how to develop HOTS-based

instructional materials and learning activities. What is perceived by the teachers is likely to be in line with the trend of recent research which focuses more on matters relating to HOTS-based assessment, such as Dhewa (2017), Widana (2017), Setiawan (2020), Tyas (2019), Suratmi (n.d.), Pulungan (2021), and many others. All of the teachers argue that it is not fair to challenge students with HOTS-based test and expect them to achieve satisfactory outcomes while they were not prepared with HOTS-based learning. Ideally, before taking HOTS-based exams, the students should be prepared with HOTS learning materials and activities so that they are accustomed to think critically. The teachers also expect that they are able to conduct HOTS but fun learning activities.

In order to enable teachers to transform their knowledge about HOTS into real activities in the classroom, not only training or workshops are needed but also coaching program is required. By means of coaching, the trainers or the institutions holding the competence reinforcement could help, guide, and ensure the teachers appropriately apply what they have already gained in the training.

4. CONCLUSION

From the above discussion, a common thread can be drawn that HOTS-based learning and assessment in the three Junior High Schools involved in this research are not yet fully implemented. This might be resulted from the teachers' lack of confidence both in terms of knowledge and practice to organize HOTS-based learning and assessment. In addition to get trainings or workshops on HOTS literacy, the teachers need accompaniment or guidance in applying what they have already learnt in their classroom. The trainers may do observation, take notes, provide comments and responses toward the teachers' activity, and hold discussions to strengthen the practice. Through this activity, the competence of teachers will grow, and their confidence will increase in designing HOTS learning and designing HOTS-based exam questions.

Furthermore, the teachers expect that they will not only be given training in designing test items but also be prepared to manage learning that can promote students' critical thinking skills. They want to carry out a learning process that is HOTS but fun in nature in order to engage the students with the process.

This research, however, did not yet cover the students' point of views of how they see the learning process as well as the learning assessment before and after their teachers join HOTS-based trainings. Do they see any differences, and how are the changes perceived? This lack then are likely to be part of interest for upcoming researchers to study on.

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